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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/067,208 04/28/98 HOWARD

W P-7860

EXAMINER

IM22/0207

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CREPEAU, J

ART UNIT

PAPER NUMBER

1745

DATE MAILED:

02/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/067,208

Applicant(s)

HOWARD, WILLIAM G.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53 and 55-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53 and 55-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office action is responsive to the CPA filed on January 30, 2001 and addresses claims 1-8, 10-17, 28-35, 37-44, 46-53, and 55-62. Claims 1-8, 28-35, 37-44, 46-53, and 55-62 are newly rejected under 35 USC 112, first and second paragraphs, and all the claims remain rejected under 35 USC 103 over the art of record. This action is non-final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8, 28-35, 37-44, 46-53, and 55-62 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, 28, 37, and 55 recite the limitation "one or more outer layers of the unidirectional electrode winding" and claim 46 recites "the outer windings of the unidirectional electrode winding." The Examiner believes that these limitations, specifically the recitation of plural outer layers or windings, are not supported by the application as originally filed. Applicants cite several passages of the instant

specification, all of which clearly support the recitation of an anode current collector being the outer layer of the electrode winding. However, there appears to be no support, either in these passages or in the drawings of the application, of an anode current collector being the “outer layers” or “outer windings” of the electrode winding, as the term “outer” is presently understood (i.e., the outer portion of the winding which is capable of touching the casing of the battery). Accordingly, it is believed that these limitations introduce new matter into the application.

Additionally, claims 37, 46, and 55 recite the limitations “at least one separator layer” and “at least a first separator layer.” The Examiner does not find support in the application for a battery containing more than two separators, which is encompassed by the language “at least one separator.” Accordingly, it is believed that these limitations also introduce new matter into the application.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-8, 28-35, 37-44, 46-53, and 55-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As indicated in paragraph 3 above, the instant claims recite a unidirectional electrode winding having plural outer layers or windings. Absent definitions of “outer layer” and “outer winding,” these limitations are unclear because it is believed that an electrode winding possesses only one outer layer or winding (i.e., the outer

portion which is capable of touching the casing of the battery). Correction and/or clarification is required.

Additionally, in the passage spanning lines 17-29 of claim 37, the amendatory markings appear to comprise two beginning brackets (“[“), but only one ending bracket (“]”). Accordingly, it is not clear which part of the claim is intended to be deleted.

Finally, claim 37 recites the limitation "the one or more outer windings" in the second-to-last line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. Claims 37-44, 55, and 57-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (U.S. Pat. 5,549,717).

In Figure 4 and in column 3, line 36-column 4, line 55, Takeuchi et al. teach an electrode assembly having two substantially straight sides and comprising spirally-wound anode and cathode assemblies. The anode assembly comprises a nickel current collector (68) and lithium strips (64, 66). A tab (72) extends from the edge of current collector 68. Current collector 68 has a smaller length and width than the length and width of lithium strip 66 (see col. 4, line 39). The cathode assembly comprises silver vanadium oxide active material (47) which is embedded into a titanium current collector (54). The current collector 54 comprises tabs (48, 50) extending from the edges. Takeuchi et al. incorporate by reference the disclosure of Keister et al (U.S. Pat.

4,830,940), which discloses that the cathode can comprise a mixture of silver vanadium oxide, PTFE binder, and graphite powder conductivity enhancer (col. 8, lines 37-42 of Keister et al). In column 4, line 26, Takeuchi et al. disclose that the separator surrounding the cathode assembly is sealed on all three open sides so that only the tabs project. In column 5, line 25, Takeuchi et al. disclose that alternatively, a separator may be folded around the anode assembly in a manner similar to the cathode assembly. In Figures 7, 8, and 10 and in column 5, line 63 et seq., the reference discloses that the portion of the anode (80) around the periphery of the electrode assembly requires only one lithium strip.

Takeuchi et al. do not explicitly teach that the anode current collector forms the outer layer (winding) of the electrode assembly, or the exact length and height of the anode current collector as a percentage of the length and height of the lithium strip.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Takeuchi et al. provides sufficient guidance for the artisan to ascertain that the anode current collector forms the outer layer (winding) of the electrode assembly. As stated above, the reference discloses that the portion of the anode around the periphery of the electrode assembly requires only one lithium strip. From this disclosure, the artisan would be able to ascertain that the one lithium strip would be present on the inside portion of the anode current collector, in order to make contact with a corresponding cathode active material layer. Accordingly, it would be well within the skill of the art to ascertain that the anode current collector would form the outer layer of the electrode assembly.

Additionally, the length and height of the current collector are parameters which may be optimized by the artisan to achieve a particular result, i.e., the utilization rate of active material, current density, etc. It has been held that when the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (*In re Aller, Lacey, and Hall*, 105 USPQ 233).

Response to Arguments

Applicant's arguments filed January 30, 2001 have been fully considered but they are not persuasive. Applicants simply state that Takeuchi et al. do not teach or suggest that the outer layers of the spirally wound cell are comprised of the anode current collector. For the reasons set forth above, the Examiner believes that Takeuchi et al. fairly suggest this limitation to one of ordinary skill in the art. Accordingly, this argument is not seen as persuasive.

7. Claims 46-53 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. as applied to claims 37-44, 55, and 57-62 above, and further in view of Goebel et al (U.S. Patent 4,565,752).

Takeuchi et al. do not explicitly teach that the cathode current collector is longer and wider than the anode current collector.

Goebel et al. disclose a spirally-wound cell in Figs. 1 and 2 comprising a cathode current collector (23) that is both longer and wider than the anode current collector (29).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the configuration of Goebel et al. into the cell of Takeuchi et al. In Figure 2 and in column 3, lines 7-9, Takeuchi disclose a cell casing which functions as a terminal (i.e., the cell is either "case-positive" or "case-negative"). Upon inspection of the Goebel et al. reference, it is apparent that the oversized cathode current collector is designed to facilitate the construction of the cell as a case-positive cell (i.e., the entire outside of the cell except for the negative terminal acts as the positive terminal). In column 1, lines 41-50, Goebel et al. state that their design is economical while being mechanically and electrically sound, as compared to other designs to hold a battery stack in position. Therefore, the artisan would be motivated to incorporate the oversized cathode current collector configuration into the cell of Takeuchi et al. in hopes of creating a more mechanically stable and economically viable battery.

Additionally, regarding the limitations in the instant claims which recite the length and height of the anode current collector as a percentage of the length and height of the cathode current collector, these lengths and widths are optimizable parameters for the reasons set forth above, and are thus rendered obvious to the skilled artisan.

8. Claims 1-8 and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. as applied to claims 37-44, 55, and 57-62 above, and further in view of Kelm (U.S. Pat. 5,486,215).

Takeuchi et al. do not explicitly teach that separators cover both the cathode and anode assemblies.

Kelm teaches separators covering spirally wound anode and cathode assemblies in column 4, lines 60-66 and column 5, line 52.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the patent of Kelm shows that using separators simultaneously on the anode and cathode assemblies is well known in the art. Although Takeuchi et al. in effect disclose that a separator is placed on either the anode *or* the cathode assembly, the artisan would understand that covering both electrode assemblies (as shown by Kelm) would be an advantageous modification of the battery of Takeuchi et al. because dendrite protection would be increased and delamination of both active material layers would be decreased. As stated in Kelm at column 3, line 5, "[t]he separator pouch then prevents the transport of stray material in the cell which could cause a short circuit and the double thickness of the separator between anode and cathode elements better resists damage during the winding process". Additionally, although Takeuchi et al. do not explicitly teach that tab(s) project through slits in the separators, this configuration is also clearly shown in Kelm and is considered to be obvious to the skilled artisan.

9. Claims 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. in view of Kelm as applied to claims 1-8 and 10-17 above, and further in view of Goebel et al.

The combination of Takeuchi et al. and Kelm do not explicitly teach that the cathode current collector is longer and wider than the anode current collector.

Goebel et al. disclose a spirally-wound cell in Figs. 1 and 2 comprising a cathode current collector (23) that is both longer and wider than the anode current collector (29).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the configuration of Goebel et al. into the cell of Takeuchi et al. In Figure 2 and in column 3, lines 7-9, Takeuchi disclose a cell casing which functions as a terminal (i.e., the cell is either "case-positive" or "case-negative"). Upon inspection of the Goebel et al. reference, it is apparent that the oversized cathode current collector is designed to facilitate the construction of the cell as a case-positive cell (i.e., the entire outside of the cell except for the negative terminal acts as the positive terminal). In column 1, lines 41-50, Goebel et al. state that their design is economical while being mechanically and electrically sound, as compared to other designs to hold a battery stack in position. Therefore, the artisan would be motivated to incorporate the oversized cathode current collector configuration into the cell of Takeuchi et al. in hopes of creating a more mechanically stable and economically viable battery.

Additionally, regarding the limitations in the instant claims which recite the length and height of the anode current collector as a percentage of the length and height of the cathode

current collector, these lengths and widths are optimizable parameters for the reasons set forth above, and are thus rendered obvious to the skilled artisan.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, can be reached at (703) 308-0756. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

Documents may be faxed to (703) 306-3429. The official fax number for documents of extreme importance is (703) 305-3599 (it will take longer to receive documents faxed to this number; therefore the first number is preferred).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700

JSC

February 5, 2001